OPERATING INSTRUCTIONS OLYMPIA
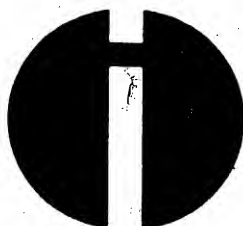
electronic compact RO

RIBBON REQ'D

T324-MSB
For:
NAKAJIMA / OLIVETTI / OLYMPIA
ROYAL / SMITH CORONA
SWINTEC / XEROX

MS BLACK
1/2" X 265 FT

Olympia International

INFORMATION AND COMMUNICATION SYSTEMS

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SECTION I
MEET THE DAISY WHEEL PRINTER

1.1) Packing List

After opening the carton carefully, check that all parts listed below have been included and that they are undamaged.

1.2) Contents

Item	Qty
electronic compact RO printer	1
Print wheel, prestige 12 pitch	1
Multistrike ribbon cartridge	1
Print mechanism packing support	2
Power cord	1

1.3) Description of the electronic compact RO Daisy Wheel printer

The Daisy Wheel Printer is an easy-to-operate, microprocessor controlled impact serial printer that uses Print wheel techniques. The printer is completely self-contained and composed of mechanical and electromechanical components, as well as a logic-printed circuit board. The logic board uses microprocessor technology, while the carriage motion system uses a linear step motor to minimize the number of components necessary for operation and to increase reliability.

1.3.1 Electronic Compact RO Specification

Printer Type	Daisy Wheel Letter Quality Printer. Microprocessor controlled for print functions.
Daisy Wheel Print Element	Plastic, with 100 characters
Print Pitch	Character Pitch with 115 CH/10 CPI 138 CH/12 CPI 173 CH/15 CPI
Paper	Cut sheet or fan fold
Paper Capacity	2¼-13"for pin feed Max 13" for friction feed
Paper Feed	Friction or pin feed
Copy Capacity	Original plus 4 copies
Print Speed	12 CPS/10 Pitch, 13 CPS/12 Pitch, 14 CPS/15 Pitch
Impression	Controlled by dip switch
Line Feed Speed	Approximately 100 MS
Ribbon Cartridge	Multi strike (Std.) MFG.Nº T324-MSB Nylon fabrics
Operator Controls	Power On/Off, On-Line, Line Feed, Form Feed
Power Requirements	120VAC ±10%, 60Hz, 70W
indfcator	LED (power, ready, on-line, check)
Wordstar' Compatible	Yes (except sub-script, super-script, ribbon color)
Interface	Serial RS-232C (X/On, X/Off), and Centronics parallel
Environmental Data	Operating Temperature : 10° to 40℃ Storage Temperature : 20℃ to 70℃
Noise Level	Less than 65dB
Life	Printer Life: 3 yrs/50,000,000 strokes MTBF: 12,000,000 strokes Print Wheel: 6,000,000 strokes
Type Style	Prestige 10 Pitch, 12 Pitch (Std. Prestige Elite) Courier 10 Pitch, 12 Pitch Mikron 15 Pitch Cubic 10 Pitch Great Script 10 Pitch Orator (go) 10 Pitch

※Registered Trademark of Micropro International Corp.

1.3.2 Exterior view of the Daisy Wheel Printer and parts identification

figure 1
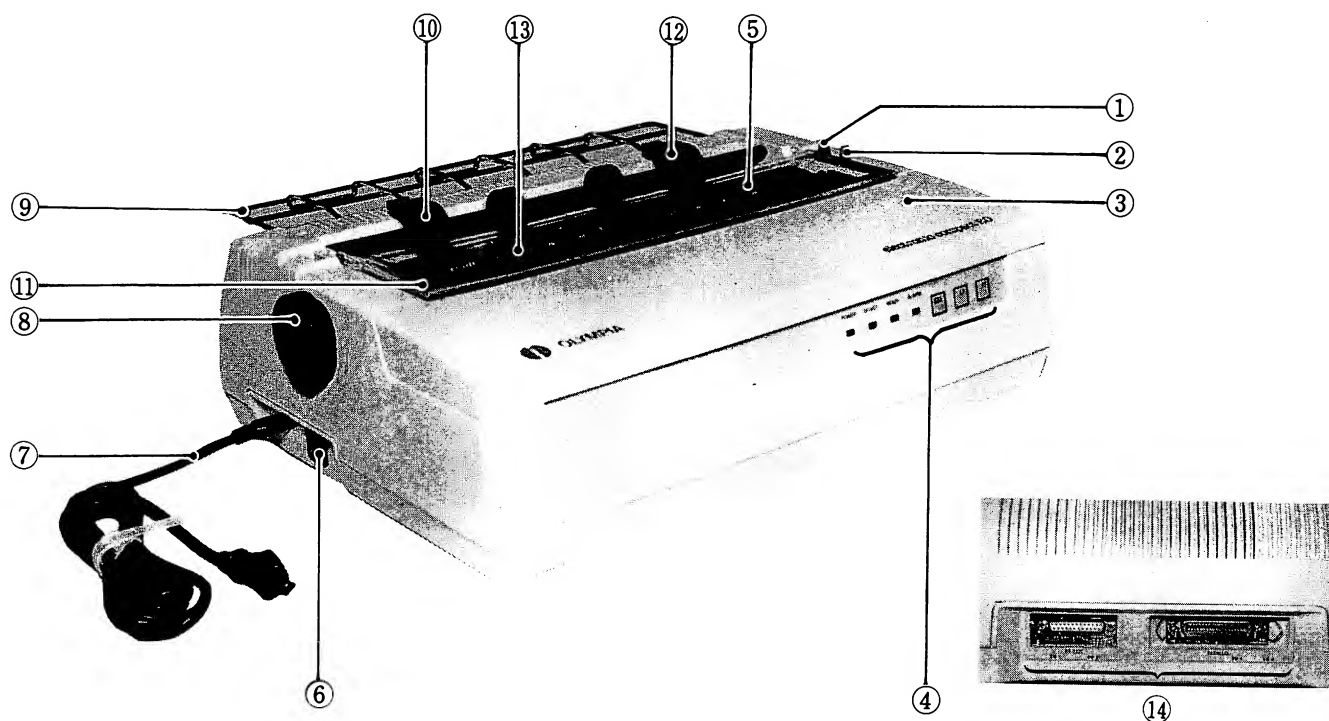
①	Paper release lever	⑧	Platen knob
②	Paper bail lever	⑨	Paper hanger
③	Top cover	⑩	Tractor L.H
④	Control panel (see 1.3.2.1)	⑪	Noise Cover
⑤	Erasure table	⑫	Tractor R.H
⑥	Power source switch	⑬	Paper bail
⑦	Power supply cord	⑭	Connector and DIP switch (see 1.3.2.2.)

1.3.2.1 Control Panel
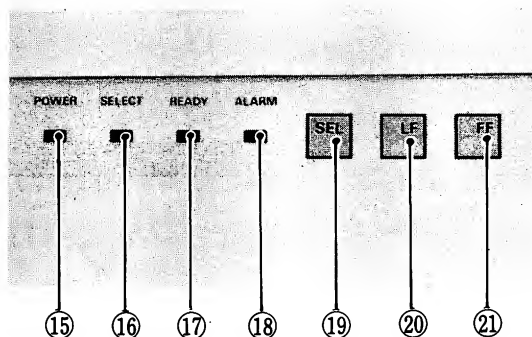
figure 2

⑮ Power indicator
⑯ Select indicator
⑰ Ready indicator
⑱ Alarm indicator
⑲ Select switch
⑳ Line feed switch
㉑ Front feed switch

1.3.2.2   DIP Switch

Verify manufacturer's preset DIP switch setting for:
- 9600 baud rate
- serial interface
- 8 bit data
- no parity
- 1 stop bit
- pica mode (10 characters per inch), 6 lines per inch

DIP no.	pos. ON	pos. OFF
1	1,4	2,3,5,6,7,8
2	5	1,2,3,4,6,7,8
3	2	1,3,4,5,6,7,8
4	1,3,4	2,5,6,7,8

table 1

For settings other than the above, see Section III, TECHNICAL INFORMATION for setting procedures.

figure 3
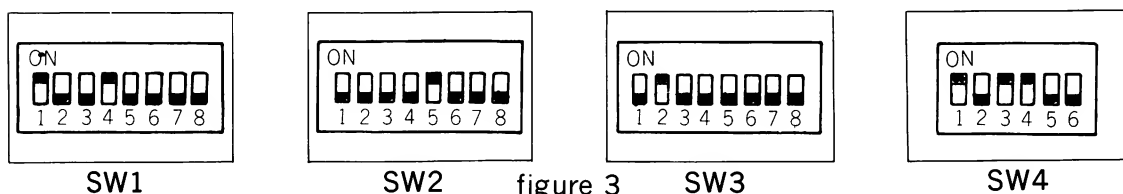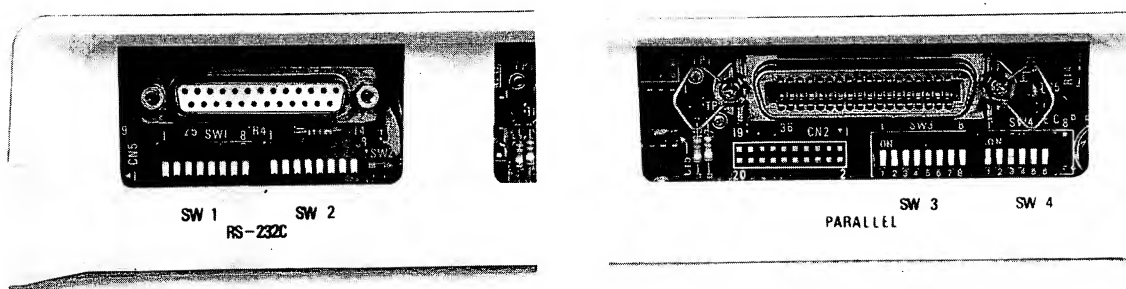
1.3.2.2.1   Baud Rate Selection

Data transfer rate (bits/sec)	Dip switch 2		
	sw- 1	sw- 2	sw- 3
110	ON	ON	ON
150	OFF	ON	ON
300	ON	OFF	ON
600	OFF	OFF	ON
1200	ON	ON	OFF
2400	OFF	ON	OFF
4800	ON	OFF	OFF
9600	OFF	OFF	OFF

table 2

SECTION II
HOW TO RUN THE DAISY WHEEL PRINTER

2.1) <u>Setting Up the Daisy Wheel Printer for Operation</u>

1. Flip the wire paper hanger backwards.

Picture ⓐ   Picture ⓑ
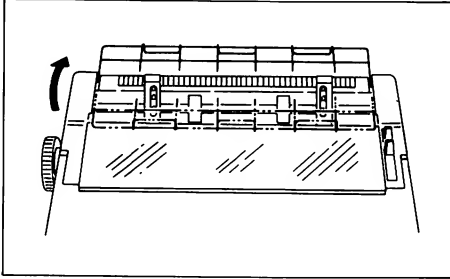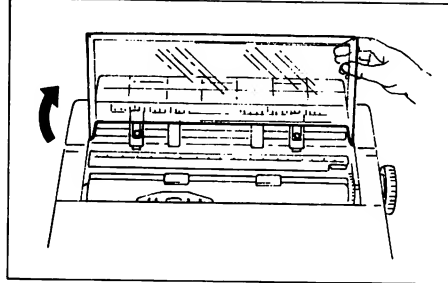
2. Lift up the top cover of the printer. Remove the two yellow print- mechanism packing supports and paper on cassette ribbon (Pictureⓓ) from the printer.

Picture ⓐ   Picture ⓑ
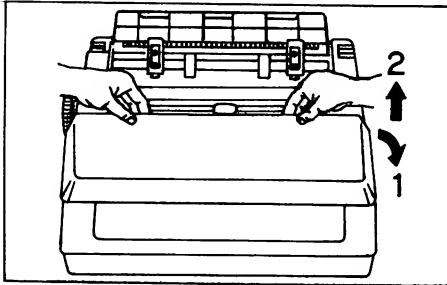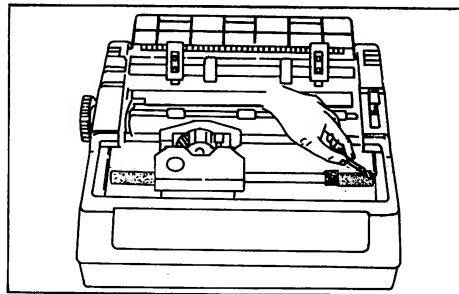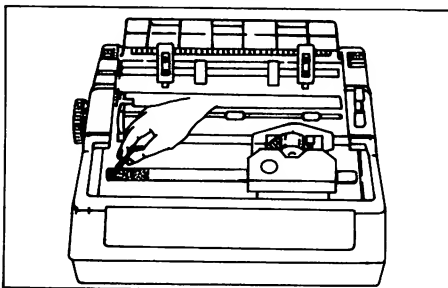
Picture ⓒ   Picture ⓓ
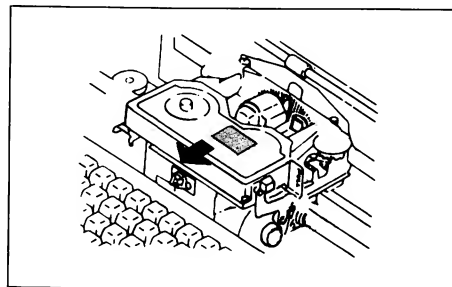
figure 5

3. Plug the power cord into the printer socket. Plug either an RS-232C or a parallel interface cable into the socket provided for it.
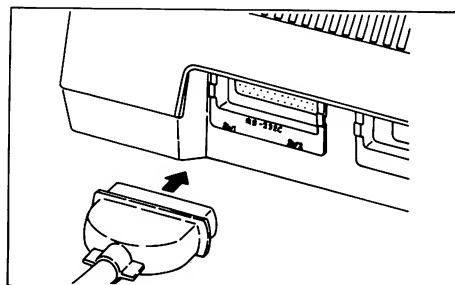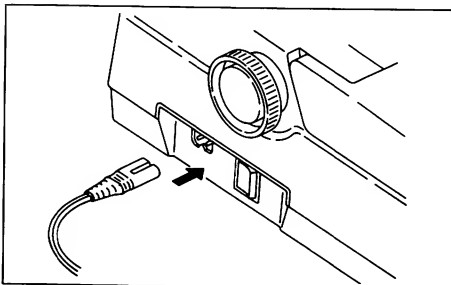
figure 6

4. Paper Loading

When using single sheet paper, move left and right tractors to far left and right side respectively.(Picture ①)

Continuous forms should be inserted as follows :

① Set tractor pin guides to proper width. (Picture ⓐ)

② Flip pin guide cover up and raise paper lever. (Picture ⓑ)

③ Match holes in paper to pins, close the pin guide cover. (Picture ⓒ)

④ Manually turn the platen Knob. (Picture ⓒ)

⑤ Push the paper release lever to release the pressure on the paper and adjust the alignment and margins. Return the paper bail lever to the close position and leave the paper release lever in pushed position. (Picture ⓓ)
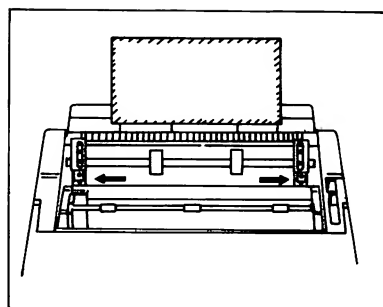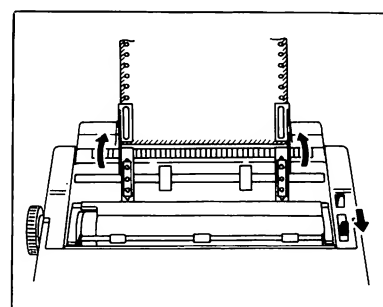
Picture ⓐ   Picture ⓑ
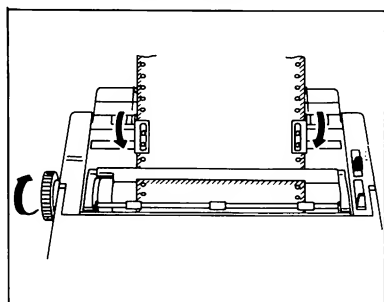
Picture ⓒ   Picture ⓓ
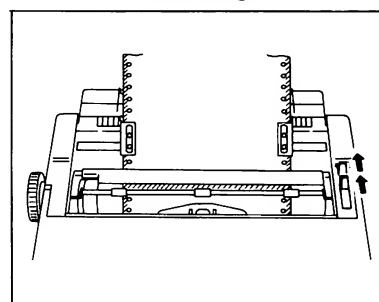
figure 7

2.2) Print Wheel Self-test Procedures

The self-test function enables the user to test whether the printer is operating correctly. It can be initiated by pressing the line feed switch while turning the power on. Below is a test pattern that is printed out while in self-test mode.The printer must be turned off to terminate the test.
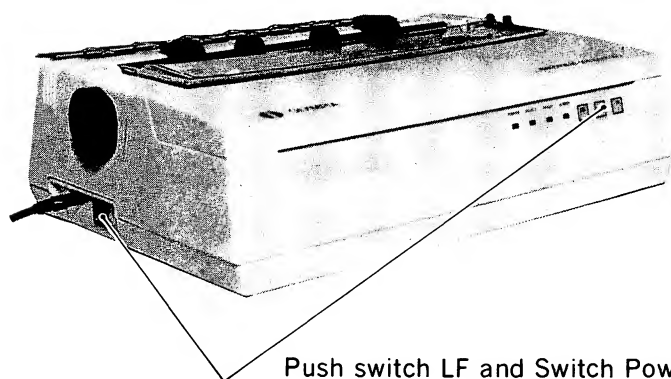
Push switch LF and Switch Power ON at same time.

2.3) Maintenance and Service

To clean the printer, lightly dust the immediate visible parts of the outside with a clean, dry cloth. Never use water or organic solvents, such as acetone or paint thinner for cleaning.

When opening the lid to replace the wheel, be careful not to drop objects, metallic or not, as these could block mechanical movements. Metallic objects such as pins or clips may shortcircuit components.

All other operations should be left to the service engineer. Printers still under warranty will be serviced free of charge for malfunctions resulting from normal use. Problems arising from causes other than normal use, such as those caused by negligence, abuse, or tampering with the machine's inner workings are not covered by the warranty agreement.

2.3.1 Trouble Shooting

Before contacting the service engineer, check the following:
- the power source used must have the correct voltage required for the printer.
- the power plug is correctly inserted and the printer is switched on.
- the ribbon cassette and print wheel are firmly in place.
- the power, on line, and ready LED's are lit.

If, after checking all of the above, the printer still fails to operate, contact the service engineer.

2.3.2 Replacing the Ribbon Cassette

Open the lid of the printer.
① Push the cassette release lever towards the arrow mark. (Picture ⓐ)
② Lift the cassette up to remove it. (Picture ⓑ)
③ Wind the lead tape of the new ribbon. (Picture ⓒ)
④ Position the ribbon in the ribbon lift mechanism (lifted when the cassette is released) and place the cassette in the cassette stand. (Picture ⓓ)
⑤ Pull the cassette release lever back to its original position. (Picture ⓔ)
⑥ Close the lid of the printer.

Picture ⓐ　　　　　Picture ⓑ　　　　　Picture ⓒ

Picture ⓓ　　　　　Picture ⓔ

Ribbon Guides

Ribbon

figure 9

6
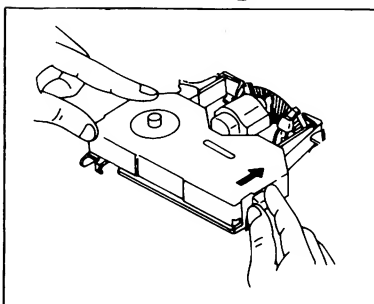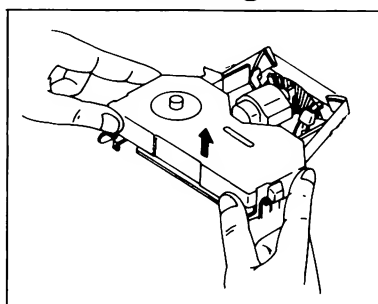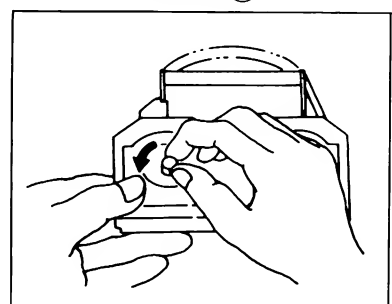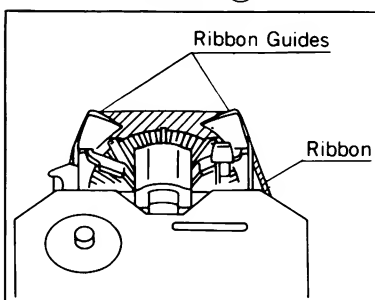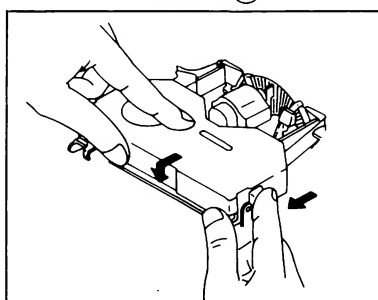
2.3.3　Replacing the Print Wheel

① Open the lid of the printer and remove the ribbon cassette.
② Pull the print wheel release lever backwards. The print wheel assembly should tilt towards the front of the printer. (Picture ⓐ)
③ The print wheel can be removed by pressing the release lever further. (Picture ⓑ)
④ Match the center hole of the new wheel with the center of the print wheel holder Make sure that the guide pin also matches to guide in the wheel. (Picture ⓒ/ⓓ)
⑤ Push the central part of the print wheel until it hits flat the guide face. (Picture ⓔ)
⑥ Push the release lever of the print wheel slowly towards the platen and the print wheel unit should lock in place. (Picture ⓕ)
⑦ Mount the ribbon cassette and replace the lid of the printer.

Picture ⓐ

Picture ⓑ

Picture ⓒ

Center Shaft

Guide Pin

Print Hammer
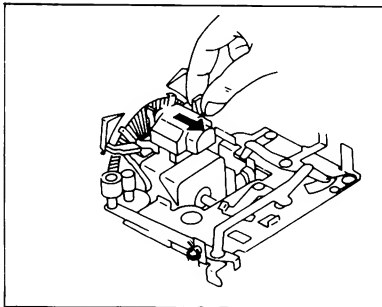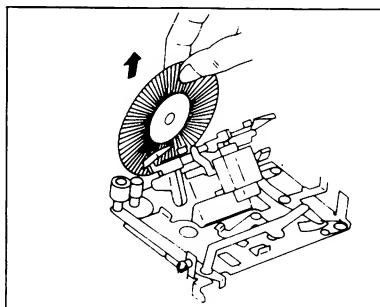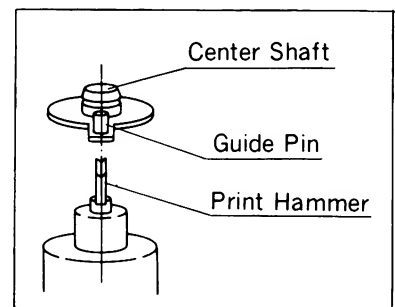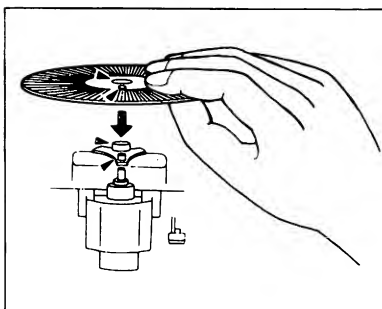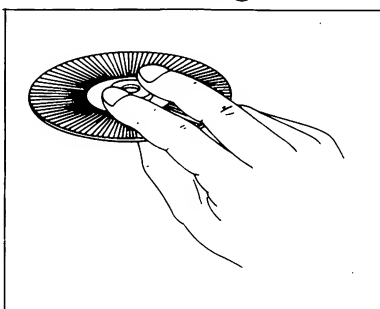
Picture ⓓ

Picture ⓔ

Picture ⓕ
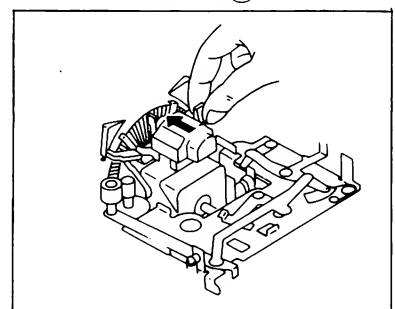
figure 10

2.4)　Paper Empty Switch

1 When the paper runs out, the "Alarm" light on the control panel comes on and the printer automatically goes to the "OFF LINE" mode.
2 Insert and Position new paper. Press the "Select" switch. The "Ready" light comes on and the printer returns to the "ON LINE" mode.
The printer is now ready for printing.

2.5)　Cover Switch

1 When removing the cover to replace the print wheel or ribbon cassette, the "Alarm" light on the control panel comes on and the printer automatically goes to the "OFF LINE" mode.
2 Replace the Top Cover.
Then press the "Select" switch. The "Ready" light comes on and the printer returns to the "ON LINE" mode.
The printer is now ready for printing.

SECTION III
TECHNICAL INFORMATION

3.1) Basic Components of the Daisy Wheel Printer

This Printer is composed of three basic blocks:

- Printer mechanism
- Control circuit board
- Power source circuit

These modules are located at the back of the printer mechanism and are interconnected to each other. (Figure 11 shows the block diagram of the printer).
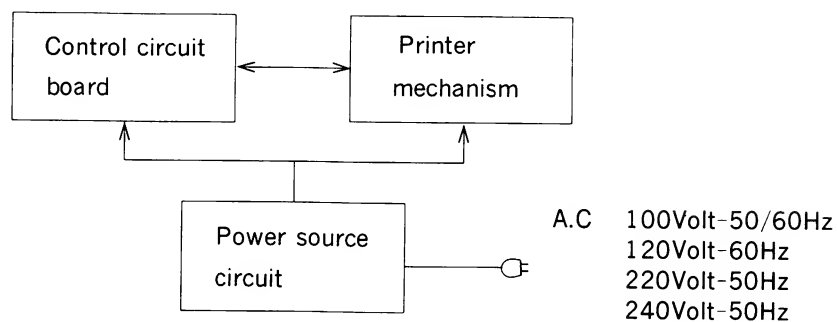
figure 11

3.1.1 Printer Mechanism

Four step motors drive the printer mechanism.

3.1.1.1 Print Wheel Step Motor. The wheel is driven by this motor, and the home position is detected by a photosensor. The CPU (Central Processing Unit located at the control circuit board), moves the wheel the minimum distance by calculating the difference between the current wheel position and the next character position ; the shortest turn is then selected. Damping is controlled by proper speed regulation so no overshoot (or a mistype as seen in the printout) would occur.

3.1.1.2 Carrier Drive Step Motor. This motor moves the print wheel carriage assembly. Its home position (leftmost print positions detected by a photosensor. The CPU again calculates the shortest carriage travel to the next print position of the following line, that is, if the last printable character is five character positions to the right and the first printable character is ten to the left, then the printer prints from right to left, printing the last character first.

3.1.1.3 Paper Feed Step Motor. This motor rotates the platen and forwards the paper vertically.

3.1.1.4 Ribbon Feed Step Motor. This drives the ribbon lift and ribbon feed.

3.1.2 Control Circuit Board

Figure 12 shows the block diagram of the electronic compact RO control circuit board.
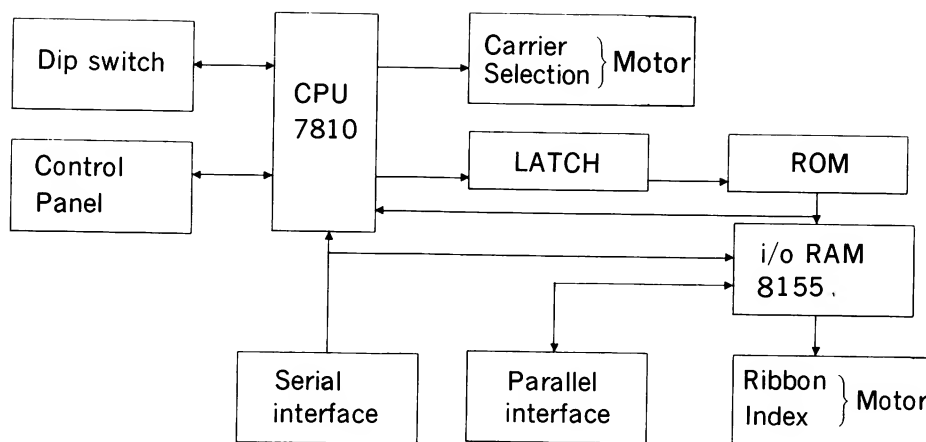
figure 12

3.1.3 Power Source Circuit

The power supply module supplies all voltages necessary to operate the printer :

DC +5V — used by the main board TTL logic circuits
DC +12V — for the serial interface and the motor's secondary voltage. A DC to DC converter is built outside the P.S. module to provide the -12 V needed for the RS-232C interface.
DC +36V — used by the step motor as the primary drive voltage.

3.1.4 DIP Switch Setting

DIP switches 1- 4 are located at the bottom of the rear connectors and are used to select the printer operating mode. See table 3 below for setting each function and factory set conditions.
DIP Switch 1.

Function		Switch Position								
		1	2	3	4	5	6	7	8	
DTR to pin 4	connected	1								*
	open	0								
DTR to pins 5,6,8	connected		1							
	open		0							*
RXD to pin 2	connected			1						
	open			0						*
RXD to pin 3	connected				1					*
	open				0					
TXD to pin 2	connected					1				*
	open					0				
TXD to pin 3	connected						1			
	open						0			*

table 3

notes : positions 7, 8 — unused
1 = ON; 0 = OFF; positions with "*" are factory settings

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DIP Switch 2.

Function		\u200b	Switch Position								
			1	2	3	4	5	6	7	8	
Baud rate	110		1	1	1						
	150		0	1	1						
	300		1	0	1						
	600		0	0	1						
	1200		1	1	0						
	2400		0	1	0						
	4800		1	0	0						
	9600		0	0	0						*
Transfer mode	parallel					1					
	serial					0					*
Data bits	8 bits						1				*
	7 bits						0				
Parity	yes							1			
	no							0			*
Parity bit	even								1		
	odd								0		*
Stop bit	2 bits									1	
	1 bit									0	*

table 4

DIP Switch 3.

Function			Switch Position								
			1	2	3	4	5	6	7	8	
Auto line feed	enable		1								
	disable		0								*
Allow DSLCT from host	yes			1							*
	no			0							
Impression control	low				0	0					*
	medium				0	1					
	high				1	0					
Character pitch	pica 10						0	0			*
	elite 12						0	1			
	micro 15						1	0			
Line pitch	⅙″								0	0	*
	¼″								0	1	
	⅓″								1	0	

table 5

DIP Switch 4.

Function			Switch Position								
			1	2	3	4	5	6	7	8	
Pull DSC,CTS,CD to +12V	yes		1								*
	no		0								
DTR active low	yes			1							
	no			0							*
DTR active high	yes				1						*
	no				0						
Disable Serial Int	yes					1					
	no					0					*
Ribbon empty alarm	yes						0				*
	no						1				
Paper empty alarm	yes							0			*
	no							1			

table 6

notes : All rows in tables above with asterisk are factory settings.

3.2) Control Codes

The electronic compact RO is designed to perform various types of special printing operations. When a control is transmitted to the printer, a function is performed instantaneously. The following table shows the available codes.

3.2.1 Table 7. Control Codes (ASCII)

lower 4 \ upper 4		0 (0000)	1 (0001)	2 (0010)	3 (0011)	4 (0100)	5 (0101)	6 (0110)	7 (0111)
0	0000	NUL		SP	0	@	P	`	p
1	0001		DC1	!	1	A	Q	a	q
2	0010			"	2	B	R	b	r
3	0011		DC3	#	3	C	S	c	s
4	0100			$	4	D	T	d	t
5	0101			%	5	E	U	e	u
6	0110			&	6	F	V	f	v
7	0111	BEL		'	7	G	W	g	w
8	1000	BS	CAN	(	8	H	X	h	x
9	1001			)	9	I	Y	i	y
A	1010	LF		* £	:	J	Z	j	z
B	1011		ESC	+ ¶	;	K	[	k	{
C	1100	FF		, §	<	L	\	l	|
D	1101	CR		− ®	=	M	]	m	}
E	1110	SO		. ±	>	N	^	n	~
F	1111	SI		/ °	?	O	_	o	

table 7

International Character Code

Hex	Dec	U.S.A.	France	Germany	U.K.	Denmark	Norway	Italy	Spain
2 1	3 3	!	!	!	!	!	´ ▲	!	!
2 3	3 5	#	£	#	£	£	£	£	#
2 A	4 2	*	*	*	*	´ ▲	*	*	*
3 C	6 0	<	½	µ	<	<	<	é	´ ▲
3 E	6 2	>	¾	°	>	>	>	è	¿
4 0	6 4	@	à	§	@	§	§	§	¨ ▲
5 B	9 1	[	[	Ä	[	Æ	Æ	à	Pts
5 C	9 2	¢	ç	ö	½	Ø	Ø	ò	Ñ
5 D	9 3	]	]	Ü	]	Å	Å	ù	ª
5 E	9 4	˙	^ ▲	¯ ▲	¼	¼	^ ▲	^ ▲	^ ▲
6 0	9 6	'	§	` ▲	²	⁄	` ▲	‰	` ▲
7 B	123	¼	é	ä	¾	æ	æ	ì	£
7 C	124	|	ù	ö	½	ø	ø	½	ñ
7 D	125	¾	è	ü	¾	å	å	ç	º
7 E	126	¹	¨ ▲	ß	³	¨ ▲	¨ ▲	¨ ▲	i

SO Code

Hex	Dec	U.S.A.	France	Germany	U.K.	Denmark	Norway	Italy	Spain
2 A	4 2	£	°	²	·	²	²	°	ç
2 B	4 3	¶	◊	³	,	³	³	◊	¹⁄
2 C	4 4	§	|	|	|	|	|	|	|
2 D	4 5	⊕	<	<	÷	^	¤	[	<
2 E	4 6	±	#	‰	°	` ▲	!	]	§
2 F	4 7	°	>	>	#	*	¼	‰	>

NOTE : This mark (▲) is dead space character

3.2.2 General Control Codes

A) BEL (bell)

When the BEL code is received, data in the buffer is printed and bell (pulsating beep) is activated for about 2 seconds.

B) BS (backspace)

When the backspace character is received, prints the data in the buffer and moves the carriage one character position to the left. Mostly used to overprint the previous character.

C) LF (line feed)

LF code allows printing of the data in the buffer and moves the paper vertically one line (the distance depends on the current line pitch selected). When there are no preceding data or all are spaces, the paper will still be fed one line.

D) FF (form feed)

When FF code is received, enables printing of the data in the buffer and feeds the paper till the top position of the next page (TOP). TOP is set to the current line on power-on or when the host computer enables the PRIME line in the parallel interface. Page size defaults to 66 lines/page (11 inches) unless changed by an ESC code (see ESC codes below) sent by the host computer.

E) CR (carriage return)

The CR code terminates the line sent and thus prints the data in the buffer, feeds the paper one line (if SW3-1 is on) and logically moves the carriage to the left (because of its logic-seeking bidirectional printing capability, the carriage physically stays in place until the CPU gives a command to move).

F) SO (shift out)

The SO code allows selection of alternate characters (ASCII 2AH to 2FH, as seen in table 7).This code is cancelled by code SI.

G) SI (shift in)

Receiving SI code cancels SO.

H) DC 1 (device control 1)

Receiving DC 1 selects the printer if SW3-2 is ON, otherwise, the code is ignored. The printer defaults on power-on in 'selected' mode.

I) DC 3 (device control 3)

Receiving DC 3 deselects the printer if SW3-2 is ON, otherwise the code is ignored. The printer when deselected ignores all incoming data except DC 1 which puts it back to a 'selected' state.

J) CAN (cancel)

This code cancels all previous data in the print buffer.

3.2.3　Escape Control Codes

The ESC code and the following ASCII character (normally called an ESCAPE sequence) allow execution of the functions listed below. The '+' sign is used as a connector, meaning the characters are sent one after the other, and not sent to the printer.

ESC	&	26H		Cancels Bold/Shadow mode
ESC	0	30H	n	Sets right margin where $2 <= n <= x$, x being 115 for Pica, 138 for Elite and 173 for Micro.
ESC	9	39H	n	Sets left margin where $1 = <n< x$, is right margin value.
ESC	3	33H		Sets line pitch to 3 lpi.
ESC	4	34H		Sets line pitch to 4 lpi.
ESC	6	36H		Sets line pitch to 6 lpi.
ESC	/	2FH		Bidirectional printing mode ON.
ESC	\	5CH		Forward printing mode ON.
ESC	C	43H	n	Changes number of lines/page (default value is 66) where $1 <= n <= 127$.
ESC	D	44H		Perform negative half-line feed.
ESC	U	55H		Perform half line feed.
ESC	E	45H		Sets underline printing mode. Data between ESC + E and terminating character are underlined, including spaces.
ESC	Z	5AH		Sets word-underline printing mode. Data between ESC + Z and terminating character are underlined except spaces in between words.
ESC	R	52H		Cancels all or word-underline modes.
ESC	P	50H		Selects Pica pitch (10 characters per inch)
ESC	F	46H		Selects Elite pitch (12 characters per inch)
ESC	M	4DH		Selects Micro pitch (15 characters per inch)
ESC	O·	4FH		Sets Bold print mode. Prints same character twice in the same position. Cancelled by CR,LF or ESC + &.
ESC	W	57H		Sets Shadow print mode. Prints same character twice with the second displaced by 1/120 of an inch to the right. Cancelled by CR,LF or ESC + &.

table 8

3.3)　Interface

3.3.1　Parallel

Centronics compatible with the following specifications:
- Data transfer rate ·· approx. 1000 cps minimum
- Synchronizing system ································ strobe signal from host
- Handshake ·· ACK/BSY signals
- Logic level ·· all interface signals at TTL level
- Connector ·· needs Amphenol 57-30360 or equivalent

pin number	return	direction	description	pin number	return	direction	description
1	19	⟶	$\overline{\text{STROBE}}$	13		⟵	SELECT
2	20	⟶	DATA 1	14			0 Volts
3	21	⟶	DATA 2	15			NC
4	22	⟶	DATA 3	16			0 Volts
5	23	⟶	DATA 4	17			CHASSIS GND
6	24	⟶	DATA 5	18			NC
7	25	⟶	DATA 6	31	30	⟶	$\overline{\text{PRIME}}$
8	26	⟶	DATA 7	32		⟵	$\overline{\text{ERROR/FAULT}}$
9	27	⟶	DATA 8	19-30,33			GND
10	28	⟵	$\overline{\text{ACKNLG}}$	34			NC
11		⟵	BUSY	35			NC
12		⟵	PE				

table 9

3.3.1.1 Signal Description

1. $\overline{\text{STROBE}}$
   - Strobe pulse that transfers data from the host computer to the printer.
   - Approximately 0.5 μsec and active LOW.
2. DATA 1- 8
   - Each signal reflects the 1st to 8th bit of parallel data.
   - Must be stable 0.5 μsec before and after the $\overline{\text{STROBE}}$ pulse.
3. $\overline{\text{ACKNLG}}$
   - A handshake pulse approximately 5 μsec in duration.
   - Tells the host computer that the character was received.
4. BUSY
   - A handshake signal that tells the host computer whether the printer is doing something (feeding paper, currently printing or off-line) or ready to accept data. This signal is active HIGH, that is, data can be received if BUSY is LOW.
5. PE
   - A signal going HIGH when ribbon is empty.
6. SELECT
   - This signal is a DC level signal which shows that the printer unit is not under the OFF line/ERROR conditions but under the SELECT condition (movement valid condition).
   When this signal is High, the printer unit is under the SELECT condition.
7. PRIME
   - This is a signal coming from the host computer. When this line goes low, the printer goes into a 'reset' cycle (as if the power has just been turned on).
8. $\overline{\text{ERROR/FAULT}}$
   - This signal is the same as PE

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3.3.1.2   Data Transfer Sequence

The following diagram shows the data transfer sequence of the parallel interface.
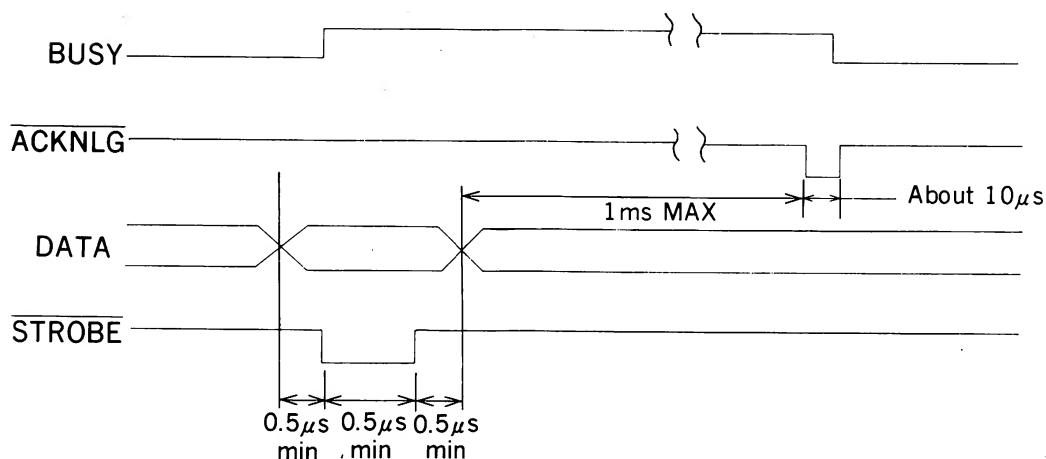

table 10

3.3.2   The Serial Interface

Specifications
- Synchronizing system ································ start/stop bit
- Data transfer rate ································· 110- 9600 bps
- Start bit ·· 1 bit
- Data length ····································· 7 or 8 bits
- Parity bit ······································· odd,even or none
- Stop bits ······································· 1 or 2 bits
- Handshake ····································· DTR (pin 4)
- Connector type ································· needs DB- 25P

3.3.2.1   Signal Description

Pin no.	Signal Name	Description
1	earth GND	protective earth GND connected to chassis
2	TXD	serial transmitting data (see DIP switch 1 for other options)
3	RXD	serial input data (see DIP switch 1 for other options)
4	DTR	data terminal ready ; hardware handshake to host (see DIP switch 1 for other options)
7	Signal GND	signal GND return

table 11

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